

**ABSTRACT OF THE DISCLOSURE**

A compact antenna system can generate RF radiation fields having increased beamwidths and bandwidths. The antenna system can include one or more patch radiators separated from each other by an air dielectric and by relatively small spacer elements. The lower patch radiators can be mounted to a printed circuit board that can include an RF feed network and a ground plane which defines a plurality of symmetrically, shaped slots. The slots within the ground plane of the printed circuit board can be excited by stubs that are part of the feed network of the printed circuit board. The slots, in turn, can establish a transverse magnetic mode of RF radiation in a cavity which is disposed adjacent to the ground plane of the printed circuit board and a ground plane of the antenna system. The feed network of the printed circuit board can be aligned with portions of the cavity such that the portions of the cavity function as a heat sink for absorbing or receiving thermal energy produced by the feed network.

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